

CLAIMS:

1. A method of bonding a cover plate over a plurality of OLED devices formed on a surface of a device substrate wherein each one of the plurality of OLED devices includes a pixelated display area and at least one electrical interconnect area, comprising:
 - a) providing the device substrate having the plurality of OLED devices formed on a surface thereof;
 - b) providing the cover plate having disposed on one surface thereof a layer of a pressure-sensitive adhesive material;
 - c) transporting the cover plate in alignment with the device substrate through a pressure roller apparatus so that the layer of the pressure-sensitive material provides uniform bonding between the cover plate and each OLED device on the device substrate, thereby achieving a plurality of packaged OLED devices; and
 - d) singulating the device substrate and the bonded cover plate to provide a plurality of individual and packaged OLED devices having a bonded cover plate and permitting access to at least outermost portions of the at least one electrical interconnect area for attaching electrical leads thereto.

20

2. The method of claim 1 wherein element a) includes providing top-emitting OLED devices, and element b) includes providing a transparent cover plate having disposed on the one surface the layer of a transparent pressure-sensitive adhesive material.

25

3. The method of claim 1 wherein element a) includes providing bottom-emitting OLED devices formed on a transparent device substrate, and element b) includes providing an optically reflective cover plate or an optically absorptive cover plate.

4. The method of claim 1 wherein element c) includes
transporting the cover plate in alignment with the device substrate through the
pressure roller apparatus while heating the pressure rollers to a temperature in a
5 range of from 40°C to 75°C so that uniform bonding is achieved over all
topological features of the OLED devices.

5. The method of claim 1 wherein element a) includes
depositing a release agent over outermost portions of each of the at least one
10 electrical interconnect area for releasing the adhesive material from such
outermost portions upon singulating the cover plate.

6. The method of claim 5 further including depositing the
release agent by a printing process, by a spraying process, by an evaporation
15 process, or by a sputtering process.

7. The method of claim 6 including depositing the release
agent from the group consisting of silicone compounds, organo-silicon
compounds, and fluorocarbon compounds.

20
8. The method of claim 1 wherein element c) includes guiding
the device substrate and the cover plate prior to and during transporting through
the pressure roller apparatus.

25
9. The method of claim 8 further including guiding at least one
lateral edge of the device substrate and the cover plate, respectively.

10. The method of claim 1 wherein element d) includes lifting of residual adhesive material from the outermost portions of the electrical interconnect area upon singulating.

5 11. A method of bonding a cover plate over a plurality of OLED devices formed on a surface of a device substrate wherein each one of the plurality of OLED devices includes a pixelated display area and at least one electrical interconnect area, comprising:

10 a) providing the device substrate having the plurality of OLED devices formed on a surface thereof;

b) providing the cover plate having disposed on one surface thereof a patterned layer of a pressure-sensitive adhesive material and at least at positions corresponding to positions of the pixelated display areas of the OLED devices;

15 c) transporting the cover plate in alignment with the device substrate through a pressure roller apparatus so that the layer of the pressure-sensitive material provides uniform bonding between the cover plate and at least the pixelated display area of each OLED device on the device substrate, thereby achieving a plurality of packaged OLED devices; and

20 d) singulating the device substrate and the bonded cover plate to provide a plurality of individual and packaged OLED devices having a bonded cover plate and permitting access to at least outermost portions of the at least one electrical interconnect area for attaching electrical leads thereto.

25 12. The method of claim 11 wherein element b) includes forming a pattern in the layer of the pressure-sensitive adhesive material prior to disposing the patterned layer on a surface of the cover plate.

13. The method of claim 12 further including selecting a pattern which keeps outermost portions of the at least one electrical interconnect area of each OLED device free from adhesive material.

5 14. The method of claim 13 including selecting a pattern of laterally spaced unidirectional stripes, a pattern of laterally spaced rectangles, squares, or a pattern of laterally spaced openings formed in the layer of the pressure-sensitive adhesive material, the positions of such openings corresponding to positions of outermost portions of the at least one electrical interconnect area of
10 each one of the plurality of OLED devices.

15 15. A plurality of packaged OLED devices made by the method according to claim 1.

16. A plurality of packaged OLED devices made by the method according to claim 11.